

# A Need for Sesame Thresher

Er. B. Kailashkumar

M.Tech, (Farm Machinery and Power), Agricultural Engineering College and Research Institute,  
Tamil Nadu Agricultural University, Kumulur, Tamil Nadu, India

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## ABSTRACT

Sesame (*Sesamum indicum* L.) crop is grown in all seasons of the year and being a short duration crop, fits well into various cropping systems. The international market of sesame is on the rise due to high demand and various uses. It was reported that there is about 5 to 10 percent loss from the time of harvest to cleaning and storing. The losses notice dare mainly contributed to non-uniform maturity and improper threshing operation (Status paper on oil seeds, 2014). One of the measures to avoid post-harvest losses is timely harvesting with proper method and adoption of modern mechanical methods of threshing and winnowing.

**Keywords:** Sesame, capsule, oil, thresher

## INTRODUCTION

Sesame (*Sesamum indicum* L.) is the oldest indigenous oilseed crop, with longest history of cultivation in India. Sesame or gingelly is commonly known as til (Hindi, Punjabi, Assamese, Bengali, Marathi), tal (Gujarati), nuvvulu, manchi nuvvulu (Telugu), ellu (Tamil, Malayalam, Kannada), tila/pitratarpa (Sanskrit) and rasi (Odia) in different parts of India. Sesame is considered to have both nutritional and medicinal values. The seeds are used either decorticated or whole in sweets such as sesame bars and halva, in baked products, or milled to get high-grade edible oil or tahini, an oily paste (Bedigian, 2004).

Sesame grain provides excellent food, nutrition, health care, edible oil and biomedicine. The grain is rich source of linoleic acid, vitamins E, A, B1, B2 and niacin and minerals including calcium and phosphorus. The grains are used in the preparation of baby foods considered as the best substitute for mother's milk to compensate the breast-feeding. Sesame is called as the Queen of oils. Sesame oil is used in manufacturing of soaps, cosmetics, perfumes, insecticides and pharmaceutical products. Sesame cake is by-product of the oil milling industry and valued as livestock feed because of its high methane content. Sesame seeds contain 50-60 % oil and 19-25 % protein with antioxidants lignans such as sesamol and sesamin, which prevent rancidity and give sesame oil a long shelf life. The lignin contents have useful physiological effects in human and animal health. The oil with 85 per cent unsaturated fatty acids, is highly stable and has reducing effect on cholesterol and prevents coronary heart diseases.

## Sesame cultivation scenario in India and Tamil Nadu

Sesame is cultivated over an area of more than 7 million ha in world with an annual production of 4 million tonnes and yield of 535 kg ha<sup>-1</sup> (Status paper on oil seeds, 2014). India, Myanmar, Sudan, China are the major sesame growing countries. India annually produces 7.378 lakh tonnes of sesame from 19.67 lakh ha (Directorate of Economics and Statistics, 2014). Tamil Nadu is the 6<sup>th</sup> largest producer of

sesame with production of 17179 tonnes from an area of 33181 ha with productivity of 518 kg ha<sup>-1</sup> (Department of Economics & Statistics, 2014). Thanjavur, Erode, Cuddalore, Karur, Salem, Villupuram, Thiruvannamalai, Krishnagiri, Ramanathapuram, Nagapattinam, Viruthunagar are some of the major sesame growing districts of Tamil Nadu (Directorate of Economics and Statistics, 2014). Sesame is grown during four seasons viz., June - July, October - November, January - February, April - May.

## Sesame Crop

Sesame is an annual plant which, depending on the cultivar, varies in height from 0.5 to 2 m; however, varieties that are 1.0 to 1.4 m high are more common. The capsules vary in length from 2 to 7 cm long, they may be square or oblong with a shorter or longer tapered apex (beak). They are usually bi-carpellate or tetracarpellate, and in each carpel there are two locules as shown in Fig.1. The number of capsules per plant depends on the variety and the environment.



Fig. 1 Sesame Capsule

### Existing practice of sesame threshing

Sesame grains are protected by a capsule which only bursts when the grains are completely ripe. The dehiscence time tends to vary, so farmers cut plants by hand and place them together in an upright position to continue ripening until all the capsules have opened. Since sesame is a small, flat grain it is difficult to dry it after harvest because the small grain makes movement of air around the atmosphere. Therefore, the grains need to be harvested as dry as possible and stored at 6 per cent (d.b.) moisture or less. If the grain is too moist, it can quickly heat up and become rancid.

The conventional method of sesame threshing includes heaping of the harvested sesame stalks for curing for three days, initial shaking of cured sesame stalks, subsequent drying for one more day and shaking of stalks and manual beating of sesame stalks to separate the remaining grains from stalk.

The traditional method of sesame threshing often results in some losses due to the grain being broken or buried in the earth (FAO, 1995). This process is slow and energy consuming. Often this local method of processing the crop leads to low quality product, due to the presence of impurities like stones, dust and chaff. Threshing and separation of the grain from these impurities requires modern technology that can be easily maintained and repaired for effectively utilization.

### Labour utilization pattern in sesame cultivation

The labour utilization pattern in sesame cultivation is shown in Fig.2. It is seen that threshing accounts for 20 per cent of the total labour requirement in sesame cultivation. The major constraints in sesame cultivation is non-availability of labour in time, especially during peak periods of harvesting and threshing. Delayed harvesting and threshing results in yield loss. Manual threshing results in higher cost of cultivation.

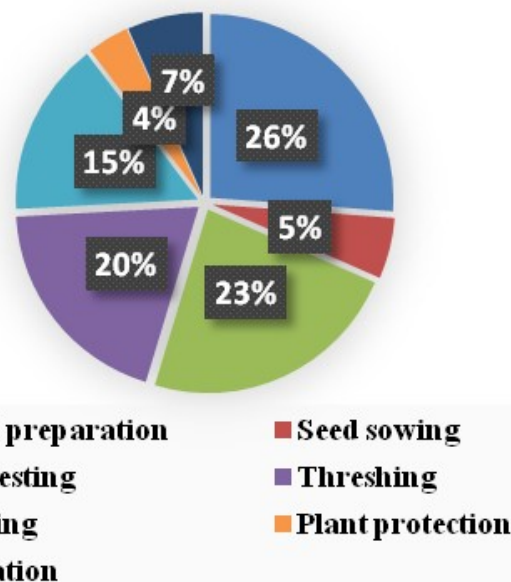


Fig.2 Labour utilization pattern in sesame cultivation

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### Purpose of sesame thresher

Farmers face lot of production constraints which include high cost of labour, non-availability of quality seeds etc. Producers were not using improved technologies and high yielding varieties. Due to uneven maturity of sesame capsules, seasonality in production and poor post-harvest practices, the post-harvest losses are reported to be high in sub-standardized marketing system, thus reducing further availability of sesame for consumption, value addition and export. The traditional methods of threshing operations are most time consuming, energy intensive, labour intensive, drudgery prone and uneconomical (Naveen kumar *et al.*, 2013; Hussien Abagisaa *et al.*, 2015 and Omale *et al.*, 2015). The development of mechanical threshers for this purpose has clearly an edge over conventional methods and has reduced the drudgery of work to a great extent (Singh *et al.*, 2015 and Kedar Patil *et al.*, 2016). The use of these stationary threshing machines is based on the quick process, level of performance, reduction of drudgery of farmers/labours, improved quality of product and economy. With existing socioeconomic condition of sesame cultivars, the large capacity threshers are inappropriate and even the small size thresher with large-scale sophistication are difficult to be adopted (Singh *et al.*, 2002). Worldwide number of studies have been done for threshing of various crops but a very few studies has been reported on sesame threshing.

Sesame crop face lot of production as well as marketing problems. The production constraints include high cost of labour, non-availability of quality seeds and suitable machines etc. Producers were not using improved technologies and high yielding varieties. They also did not adopt improved equipment's and post-harvest technologies. Similarly, the marketing constraints faced by the farmers were undue price fluctuations, lack of storage yard etc.

In the present scenario, due to the gradual increase in population, there is too much of demand in the farm sector due to the scarcity of daily labours. The output from these labours is less productive due to manual operations adopted by them. Also heavy machines cannot be introduced due to affordability and limited area of cultivation of sesame. Thus understanding this need, it is very essential to bring in a sesame thresher which is cost effective, compact and easy to use for sesame cultivars. Therefore, the development of sesame thresher is keenly felt.

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